19

What is claimed is:

1. A speech recognition method comprising the steps of (a) selecting, based on a first utterance by a speaker, adaptable trained patterns from a plurality of trained patterns, the plurality of stored trained patterns and classified by a characteristic of a training speaker;

(b) finding a distortion coefficient fixed by spectral region of speech for an utterance by the speaker, based on the first utterance by the speaker and the selected trained patterns; and

(c) recognizing an input speech sound following the first utterance by using the selected trained patterns and the distortion coefficient.

2. A speech recognition method according to claim 1 wherein the trained patterns are classified by ages of the training speakers.

3. A speech recognition method according to claim 1 wherein the trained patterns are classified by regions.

4. A speech recognition method according to claim 1, wherein the trained patterns comprise

(a) an average value of utterance for each characteristic category,

(b) a covariance value of the utterance for each characteristic category,

(c) an average value of each lexical unit by every speaker, and

(d) a covariance value of the utterance by every speaker.

5. A speech recognition method according to claim 2 wherein the trained patterns comprise

(a) an average value of utterance for each characteristic category,

(b) a covariance value of the utterance for each characteristic category,

(c) an average value of each lexical unit by every speaker, and

(d) a covariance value of the utterance by every speaker.

6. A speech recognition method according to claim 3 wherein the trained patterns comprise

(a) an average value of utterance for each characteristic category,

(b) a covariance value of the utterance for each characteristic category,

(c) an average value of each lexical unit by every speaker, and

(d) a covariance value of the utterance by every speaker.

7. A speech recognition method according to claim 4, wherein the step (a) of selecting the adaptable trained patterns includes a distance calculation between the first utterance by the speaker and trained patterns,

the trained patterns comprising

(a) an average value of the utterance for each characteristic category,

(b) the average of each lexical unit by every speaker, and

(c) the covariance values of the utterance by every speaker.

8. A speech recognition method according to claim 5 wherein the step (a) of selecting the adaptable trained patterns includes a distance calculation between the first utterance by the speaker and trained patterns,

the trained patterns comprising

(a) an average value of the utterance for each characteristic category,

(b) the average of each lexical unit by every speaker, and

(c) the covariance values of the utterance by every speaker.

9. A speech recognition method according to claim 6 wherein the step (a) of selecting the adaptable trained patterns includes a distance calculation between the first utterance by the speaker and trained patterns,

the trained patterns comprising

(a) an average value of the utterance for each characteristic category,

(b) the average of each lexical unit by every speaker, and

(c) the covariance values of the utterance by every speaker.

10. A speech recognition method according to claim 7 further comprising a step of registering a vocabulary used for selecting the trained patterns.

11. A speech recognition method according to claim 8 further comprising a step of registering a vocabulary used for selecting the trained patterns.

12. A speech recognition method according to claim 9 further comprising a step of registering a vocabulary used for selecting the trained patterns.

13. A speech recognition method according to claim 7 further comprising a step of resetting usage of the selected trained patterns and the determined distortion coefficient, and using a next input speech sound as a first utterance.

14. A speech recognition method according to claim 8 further comprising a step of resetting usage of the selected trained patterns and the determined distortion coefficient, and using a next input speech sound as a first utterance.

15. A speech recognition method according to claim 9 further comprising a step of resetting usage of the selected trained patterns and the determined distortion coefficient, and using a next input speech sound as a first utterance.

16. A speech recognition apparatus comprising:

(a) an acoustic analysis unit for acoustically analyzing an input speech sound to find acoustic parameters;

(b) a pattern by-characteristic storage for previously holding a plurality of trained patterns classified by characteristic of a training speaker;

(c) a pattern by-characteristic selection unit for selecting adaptable trained patterns from the plurality of trained patterns based on a first utterance by a speaker;

(d) a speaker adaptation processor for finding a distortion coefficient fixed by spectral region of speech for acoustic parameters of the first utterance by the speaker using the acoustic parameters and the trained patterns selected by said pattern selection unit; and

(e) a word lexicon including known words to be recognized.

(f) a speech recognition unit for recognizing an input speech sound following the first utterance using the distortion coefficient, the selected trained patterns and the word lexicon.

17. A speech recognition apparatus according to claim 16 wherein

(a) said pattern selection unit selects the adaptable trained patterns by distance calculation between the acoustic parameters of the first utterance by the speaker and the trained patterns, the trained patterns comprising

(a1) an average value of utterance for each characteristic category,

(a2) an average value of each lexical unit by every speaker, and

(a3) a covariance value of the utterance by every speaker,

(b) said pattern selection unit outputs the trained patterns comprising

(b1) an average value of utterance for a selected characteristic category, and

(b2) a covariance value of the utterance for the characteristic category.

18. A speech recognition apparatus according to claim 16 further comprising a pattern selection word file including known words to be selected as patterns.

19. A speech recognition apparatus according to claim 18 wherein the known words of said word lexicon respectively include known words to be recognized with a second utterance.

20. A speech recognition apparatus according to claim 18 wherein said speech recognition unit further comprises a function of registering a new vocabulary.

21. A speech recognition apparatus according to claim 16 further comprising a reset signal generation unit for resetting usage of the selected trained patterns and the obtained distortion coefficient and for using a next input speech sound as a first utterance.

22. A voice controller comprising:

(a) a sound input unit for receiving a speech sound;

(b) an acoustic analysis unit for acoustically analyzing the speech sound from said sound input unit to provide acoustic parameters;

(c) a pattern by-characteristic storage for previously holding a plurality of trained patterns classified by characteristic of a training speaker;

(d) a pattern by-characteristic selection unit for selecting adaptable trained patterns from the plurality of trained patterns based on a first utterance by a speaker;

(e) a speaker adaptation processor for obtaining a distortion coefficient fixed by spectral region of speech for acoustic parameters of the first utterance by the speaker, using the acoustic s and the trained patterns selected by said pattern selection unit;

(f) a word lexicon comprising known words for recognition objects.

(g) a speech recognition unit for recognizing an input speech sound following the first utterance using

(g1) the distortion coefficient ,

(g2) the selected trained patterns, and

(g3) the word lexicon; and

(h) a control signal output unit for outputting a control signal from said speech recognition unit.

23. A voice controller according to claim 22 wherein

(a) said pattern selection unit selects the adaptable trained patterns by distance calculation between the acoustic parameters of the first utterance by the speaker and

the trained patterns, the trained patterns comprising

(a1) an average value of utterance for each characteristic category,

(a2) an average value of each lexical unit by every speaker, and

(a3) a covariance value of the utterance by every speaker,

(b) said pattern selection unit outputs the trained patterns comprising

(b1) an average value of utterance for a selected characteristic category, and

(b2) a covariance value of the utterance for the characteristic category.

24. A voice controller according to claim 22 wherein

(a) one word of one or a plurality of previously prepared known words is used for selecting the trained patterns, and

(b) selection of a device controlled in response to the control signal is
5 performed using the known word.

25. A voice controller according to claim 23 wherein

(c) one word of one or a plurality of previously prepared known words is used for selecting the trained patterns, and

10 (d) selection of a device controlled in response to the control signal is performed using the known word.

26. A voice controller according to claim 22 wherein the known word for selecting the trained patterns can be registered by the speaker.

15

27. A voice controller according to claim 23 wherein the known word for selecting the trained patterns can be registered by the speaker.